Class V Underground Injection Control Inspection Report

Facility Name: Quil Ceda Village Wastewater Treatment Plant
Facility Address: 8802 27th Avenue NE, Tulalip, Washington 98271
Facility Mailing Address: 8802 27th Avenue NE, Tulalip, Washington 98271
Facility Phone Number: 360-716-5053
Latitude: 48.09132
Longitude: -122.18547
Facility Participants: Lukas Reyes, Utilities Superintendent
Jeremy Gobin, Wastewater Treatment Plant Operator
Jaret Adams, Laborer

Additional Participant: Jason Schneider, Indian Health Service

Inspection Date/Time: 3/25/2013, 11:30 a.m. – 1:25 p.m.

EPA Inspector: Jennifer Parker

Inspection Comments

This inspection was pre-announced. On March 7, 2013, the U.S. Environmental Protection Agency (EPA), Region 10 Underground Injection Control (UIC) program received a request from the Consolidated Borough of Quil Ceda Village to reauthorize use of 19 injection wells for disposal of wastewater treatment plant effluent. On March 12, 2013, the EPA responded with a letter explaining that the UIC program will review the UIC file for these injection wells and conduct an inspection to observe current conditions at the facility. This was the inspection that was pre-announced in the March 12, 2013 letter and I made the final arrangements for the inspection through telephone calls with Mr. Reyes.

On March 25, 2013, I presented my inspector credentials and provided the written Notice of Inspection to Mr. Reyes (Attachment A). The inspection began in the office, where Mr. Reyes provided information about the management and operation of the wastewater treatment facility and injection wells. Mr. Gobin and Mr. Adams provided a tour of the wastewater treatment plant and the "UIC channel" after the discussion in the office.

Injection Wells

Quil Ceda Village has used 19 injection wells for disposal of wastewater treatment plant effluent since June 2003. The wells are in an "UIC channel" located on the east side of Quil Ceda Boulevard.

The "UIC channel" is divided into a north channel and a south channel, with 10 injection wells located along the north channel and 9 injection wells located along the south channel. Mr. Gobin explained that rather than operating all 19 injection wells at the same time, the facility operates only as many wells as are needed to dispose of the volume of effluent produced by the treatment plant. The facility operators manually control which injection wells receive the effluent. According to the facility representatives, on an average day, 6-7 injection wells receive approximately 170,000-180,000 gallons of injectate. At peak flows of up to 300,000 gallons per day, the facility routes some of the flow to additional injection wells to accommodate the higher volume. Mr. Gobin explained that the operators annually alternate sending the flow to the north or south channels in order to allow portions of the system to rest, but effluent is

sometimes routed to the resting wells during peak flow events. According to Mr. Gobin, the facility was using wells in the north channel during this inspection.

Photo: Looking north along the "UIC channel." 19 injection wells are located along the east side of Quil Ceda Boulevard.

The wells are located below the ground surface, but the vaults that control the flow of effluent to the injection wells and the monitoring wells are accessible just below the ground surface. Mr. Adams lifted the lids covering one of the control vaults and a monitoring well.

Photo: Control vault lid.

Photo: Looking into one of injection well control vaults.

Photo: One of the monitoring wells. According to Mr. Gobin, the fluid present around the well cap during this inspection was stormwater.

In addition to the 19 UIC channel wells, Quil Ceda Village had also been authorized to use three additional Class V injection wells for disposal of the treated wastewater effluent for up to five years for a special study that began in 2008. I asked Mr. Reyes about the status of the three special study injection wells. Mr. Reyes explained that the special study ended during summer 2011, at which time the line that had been sending the effluent to the injection wells was shut off and the wells were abandoned in place.

Treatment Plant

The facility representatives provided a tour of the treatment plant and described their operation and management of the treatment system. The information I received about the treatment plant is summarized as follows:

The Quil Ceda Village Wastewater Treatment Plant began operating during June 2003. It utilizes a membrane bioreactor (MBR) with UV disinfection to treat sanitary waste generated by Quil Ceda Village businesses and the casino. Chlorine disinfection is also provided by the treatment system for any effluent that may come into direct contact with humans when it is reused rather than injected. Mr. Reyes provided a brochure and handouts that describe the treatment system and a copy of the findings of a sanitary survey of the wastewater treatment system conducted by the Indian Health Service on October 23, 2012. (See Attachment B.)

The treatment plant components are located in three buildings: a headworks building; the MBR building; and the effluent building. According to the system operators, as they need to increase the treatment plant capacity, more buildings will be added, and if it is built out to full capacity the entire treatment plant will be connected in one building. Full build out is not expected to occur for at least 10-20 years. At present, Quil Ceda Village is planning to add a pre-air basin and two more MBRs to the treatment system but they will be housed in the existing structures. Mr. Reyes explained that the two additional MBRs will be added to increase the redundancy within the system.

Photo: MBR facility with headworks building in background.

Photo: Looking into one of the MBR tanks.

Photo: Effluent building.

Photo: Effluent and reuse pumps.

The treatment plant is managed by staff of the Consolidated Borough of Quil Ceda Village. Mr. Gobin is the primary wastewater treatment plant operator. In addition to his role as Utilities Superintendent, Mr. Reyes is one of the wastewater treatment plant operators and the construction inspector for the system. Mr. Adams is primarily assigned to work on other things, but he has been training to operate the wastewater system. Another wastewater treatment plant operator will be hired in the near future to add to their capacity.

According to the operators, purple pipes were installed throughout the village to convey effluent for reuse purposes such as watering the lawns around the business establishments, but the facility is not producing enough effluent for the intended reuse projects. At present, a small amount of the effluent is reused at the treatment plant for washing screens, tanks, and other treatment facility components and some of the effluent is used to water the treatment plant lawn. All other produced effluent is injected underground.

I asked Mr. Reyes if the facility is able to store or dispose of the effluent by alternative means if the fluid cannot be discharged through the injection wells. Mr. Reyes explained that the facility has the capacity to store approximately 300,000 gallons of effluent in the event of an emergency and Quil Ceda Village is able to send up to 50,000 gallons per day to the City of Marysville, so the facility has approximately 1.5 days alternative storage or disposal capacity for management of the produced effluent in the event of an emergency.

Mr. Reyes and Mr. Gobin explained how the operators monitor the treatment system operation. Mr. Gobin showed me a number of monitors that were built into the treatment system equipment and are used by the operators to determine if the system is performing properly. Mr. Gobin also showed me the Supervisory Control and Data Acquisition (SCADA) system located in the MBR building office. The SCADA controls all the features of the treatment plant and it is set to ring alarms if significant problems are occurring. The autodialer alarms reach the operators 24 hours a day and the operators are able to run the system by remote control if they are offsite when an alarm rings. I asked Mr. Reyes if they continuously monitor either transmembrane pressure or turbidity in this system. Mr. Reyes explained that transmembrane pressure is not relevant for this system and is not monitored because the flow is controlled by head differential rather than through vacuum suction. The Quil Ceda system was designed for continuous turbidity readings, but the turbidimeter is not working well. Mr. Reyes explained that when it is in use, the turbidimeter readings are typically 0.1-0.2, as compared to the optimal turbidity level of zero. He further explained that when the meter is running an alarm goes off if there is a turbidity spike to inform the operators that there is a problem. However, the turbidimeter was turned off during this inspection and Quil Ceda Village may replace the turbidimeter in the near future. Mr. Reyes explained that the turbidimeter has been turned off because the operators need to leave the MBR tanks open in order to ensure that the aeration diffusers are working properly, but when the tanks are open algae grows on the turbidimeter sensors and prevents them from operating properly. Since the turbidimeter is not working, the operators visually inspect the system at least once a day, if not more often. Mr. Gobin added that he also looks at the effluent to determine if it is becoming cloudy.

Effluent/Injectate Quality

An effluent sampling port is present at the effluent building at the treatment plant. Mr. Gobin explained the operators collect effluent samples from this port and analyze the samples to determine the quality of the injectate. The effluent is analyzed at the treatment plant facility only for pH, nitrate, nitrite, and ammonia using meters and Hach kits. The in-house effluent analyses are done every couple of weeks or more often, according to Mr. Gobin. Mr. Gobin also mentioned that they run MLSS (mixed liquor suspended solids) and filterability samples more frequently than the quality samples because MLSS and filterability tell the operators more about how the system is operating. All other analyses are done monthly at a commercial laboratory offsite.

Photo: Effluent sampling port.

In addition to monitoring the effluent as it exits the treatment facility prior to injection, the facility operators also collect monthly samples from 5 or 6 monitoring wells. Mr. Gobin explained that the operators typically use injectate volume meter readings to select 3 of the monitoring wells that are co-located with the injection wells to sample each month. According to Mr. Gobin, they also typically sample one or two of the B monitoring wells located throughout the property and both of the C monitoring wells each month.

Mr. Reyes receives the laboratory data electronically from the commercial laboratory and has all of the data stored on a computer where he is able to access it. He showed me the computer where the data is stored and provided hard copy printouts of data for samples collected during the months of January and February 2013. Mr. Reyes noted that the nitrate concentration in the February 2013 data for some of the monitoring wells in landscaped areas are higher than the nitrate concentration in the treatment plant effluent, and attributed the higher levels in the wells to the use of fertilizers in the vicinity of the monitoring wells.

I asked Mr. Reyes to provide a random selection of data for a few sampling events during 2010, 2011, and 2012. Mr. Reyes told me he would provide the 2010, 2011, and 2012 data electronically on a thumb drive. The thumb drive contains data for sampling events dated 1/13/10, 5/25/10, 10/7/10, 4/7/11, 5/18/11, 11/17/11, 12/19/11, 2/1/12, and 6/21/12. He also provided electronic copies of the January and February 2013 data on the same thumb drive.

In addition to the sampling data provided during this inspection, Mr. Reyes had intended to provide an updated sampling and analysis plan. However, he explained that he was unable to provide the updated plan during this inspection because the staff person who is working on the update has been out sick for a

few weeks. Mr. Reyes did not know when the staff person will return to the office or when the updated plan will be available, but he committed to provide it to the EPA when it is complete.

Additional Information

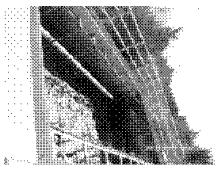
The original UIC application received by the EPA in 2002 had noted that the facility would likely submit a National Pollutant Discharge Elimination System (NPDES) permit application for disposal of the treated effluent to surface water when the capacity of the injection wells is exceeded. I asked Mr. Reyes if Quil Ceda Village is still planning to apply for an NPDES permit. Mr. Reyes responded that the injection well capacity has not been exceeded to date and is not expected to do so for a number of years, but the village is currently preparing for the eventual discharge to surface water and he estimated that the NPDES permit application may be submitted in about 3-5 years based on the current projected rate of business expansion in the village.

Also, during a previous UIC inspection in 2008, the facility representatives had mentioned that cars occasionally hop the curb along Quil Ceda Boulevard and run over the injection well lids. I asked Mr. Gobin if this still happens and if it has been an issue for any of the injection wells. He clarified that the issue in 2008 had been that the village maintenance staff had driven vehicles over the injection wells while conducting their work but that the practice was stopped and now a car might hop a curb on rare occasions, but it is not a common occurrence at this time.

Photo Log:

Photo Number	Description
SI850643.JPG	Looking into MBR tank.
SI850644.JPG	Looking toward headworks building from MBR building.
SI850645.JPG	Looking toward effluent building from MBR building.
SI850646.JPG	MBR building with headworks building in the background.
SI850647.JPG	Effluent and reuse pumps.
SI850648.JPG	Effluent sampling port.
SI850649.JPG	Looking north along “UIC channel.”
SI850650.JPG	“UIC channel.”
SI850651.JPG	A control vault and a monitoring well along “UIC channel.”
SI850652.JPG	Monitoring well. According to Mr. Gobin, the fluid around the well is stormwater.
SI850653.JPG	Looking into an injection well control vault.

Inspection Photos: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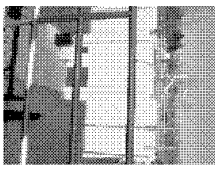
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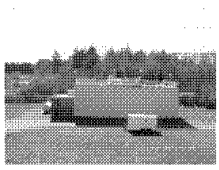
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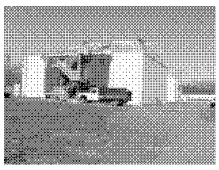
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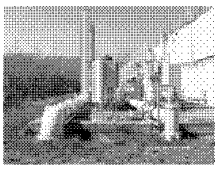
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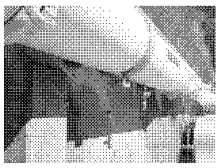
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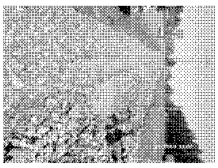
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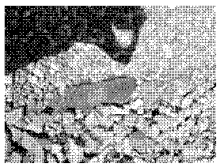
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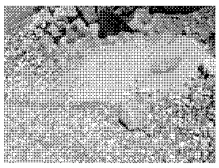
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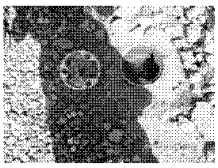
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Data Review Upon Return to the Office

Upon return to the office, I reviewed the data provided by Mr. Reyes. The 11 sets of data all include sample results for the effluent collected at the treatment plant and samples collected from monitoring wells throughout the property. A different set of monitoring wells was sampled during each event. Copies of the 2013 data are included in Attachment B and the 2010, 2011, and 2012 data are included in Attachment C.

The "plant" samples in the data sets are the samples of the injectate collected at the treatment plant prior to discharging into any injection wells. Of the 11 effluent samples, all but one of the samples were analyzed for biochemical oxygen demand (BOD), pH, nitrate, nitrite, phosphate, conductivity, fecal coliform, ammonia, total kjeldahl nitrogen, and total phosphorous. The effluent sample collected 10/7/2010 was only analyzed for BOD, pH, nitrate, nitrite, phosphate, conductivity, and fecal coliform. The data from the 11 sampling events shows the following ranges of nitrate concentrations: <1 mg/L during 8 sampling events, <7 mg/L during 2 sampling events, and 26 mg/L during one sampling event. Ranges of values for other key parameters include the following: pH ranged from 7.0-7.7; BOD was not detected during 5 sampling events, was 5 mg/L during one sampling event, ranged from 7-10 mg/L during 4 sampling events, and was 34 mg/L during one sampling event; and fecal coliform was not detected during 8 sampling events but it was detected at 7/100 mL, 30/100 mL, and 130/100 mL during the other three sampling events. All the other effluent data and the monitoring well sample data are provided on the laboratory data sheets in Attachments B and C.

Report prepared by: _____

Date completed:_____

Attachment A
Notice of Inspection

Attachment B
Hard copy handouts provided by Quil Ceda Village,
including sample data and other information

Attachment C
Printouts of the sample data provided by Quil Ceda Village on the thumb drive

(Note: the data from the sampling events on 1/3/13 and 2/28/13 were included on thumb drive but they were not reprinted since they were also provided in hard copy and are included in Attachment B.)